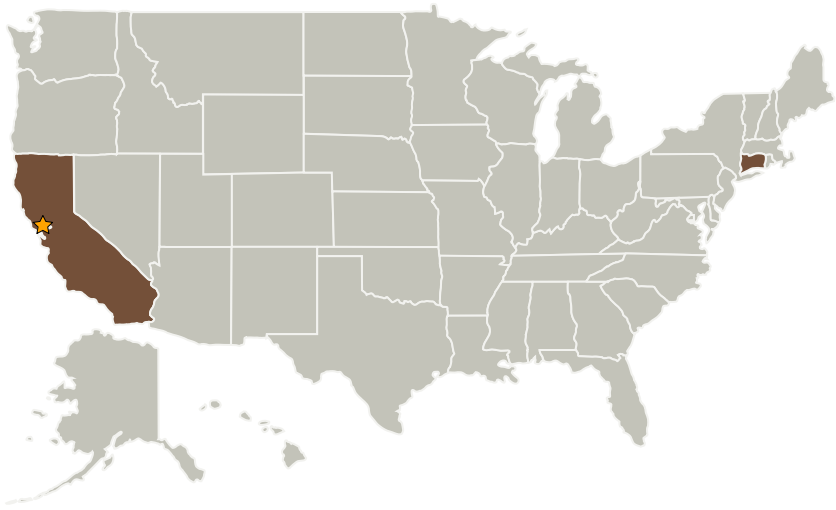
Lab-on-a-chip astrobiology analyzer, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

The overall goal of this program (through Phase III) is to develop an astrobiology analyzer to measure chemical signatures of life in extraterrestrial settings. The analyzer will employ a lab-on-a-chip to extract biochemical signatures from soil or water samples and surface-enhanced Raman spectroscopy to detect and identify the signatures. The goal of the Phase I program is to demonstrate feasibility by separating mixtures of amino acids in SER-active sol-gel capillary columns. This will be accomplished by developing new sol-gels that selectively extract the amino acids from flowing water, while at the same time providing SER activity to identify the amino acids, individually and as a class. The Phase II work will design, build and test the proposed prototype lab-on-a-chip analyzer. This will be accomplished by incorporating the sol-gel coated capillaries into a lab-on-a-chip, and performing chemical separation and Raman signal enhancement sufficiently to identify chemical signatures of life.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Real-Time Analyzers, Inc.	Supporting Organization	Industry	Middletown, Connecticut

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
California	Connecticut

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Stuart Farquharson

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.3 Manipulation
    - TX04.3.4 Sample Acquisition and Handling